

**WHAT IS CLAIMED IS:**

1 1. A method for operating a controller system connected to an inspection platform  
2 configured to perform an optical inspection process at a first degree of optical resolution and a  
3 plurality of optical inspection systems configured to perform an optical inspection process at a  
4 second degree of optical resolution, wherein each of the plurality of optical inspection systems  
5 is disposed at different locations on a substrate processing system, the method comprising:

6 receiving, from one of the plurality of optical inspection systems, process data readings  
7 comprising optical signal signature information indicative of a topographical condition on a  
8 substrate inspected by the one optical inspection system; and

9 processing the process data readings to determine a subsequent substrate handling step.

1 2. The method of claim 1, wherein processing the process data readings to determine the  
2 subsequent substrate handling step comprises:

3 determining whether the process data readings exceed a predetermined value;

4 if the data readings exceed the predetermined value, determining that an unacceptable  
5 topographical condition exists on the substrate; and

6 transferring the substrate to the inspection platform.

1 3. The method of claim 1, wherein the optical signal signature information comprises at  
2 least one of substrate reflectivity information, specular information, spectral information,  
3 substrate defect information, substrate damage information, particle contamination  
4 information, alphanumeric character information, non-uniform plasma deposition, and any  
5 combination thereof.

1 4. The method of claim 1, wherein processing the process data readings to determine the  
2 subsequent substrate handling step comprises determining whether to transfer the substrate to  
3 the inspection platform for further optical inspection.

1 5. The method of claim 1, wherein the subsequent process step is a process termination  
2 step.

1 6. The method of claim 1, wherein processing the process data readings to determine the  
2 subsequent substrate handling step comprises determining the location of the substrate in the  
3 processing system to determine a routing sequence for the substrate.

1 7. A substrate process inspection system, comprising:

2 a plurality of optical inspection systems each configured to perform an optical  
3 inspection process at a first degree of optical resolution and each comprising a transmitter unit  
4 and a receiver unit;

5 an inspection platform configured to perform an optical inspection process at a second  
6 degree of optical resolution; and

7 a controller system connected to the plurality of optical inspection systems and the  
8 inspection platform and configured to:

9 (i) process optical signal information indicative of a topographical  
10 condition on a substrate inspected by at least one of the plurality of optical inspection  
11 systems; and

12 (ii) in response to the topographical condition, cause execution of one of a  
13 plurality of subsequent substrate handling steps, wherein a first substrate handling step  
14 comprises transferring the substrate to the inspection platform for further optical  
15 inspection.

1 8. The system of claim 7, wherein each of the optical inspection systems is disposed on a  
2 processing system along a transfer path of the substrate.

1 9. The system of claim 7, wherein the receiver unit comprises at least one of a charge-  
2 coupled device (CCD) camera and a spectrometer.

1 10. The system of claim 7, further comprising an input unit for inputting control  
2 information utilized to operate the controller system.

1 11. The system of claim 7, wherein the controller system is configured to cause execution  
2 of the first substrate handling step by:

3 determining whether optical inspection data collected by at least one of the plurality of  
4 optical inspection systems exceed a predetermined value; and

5 if so, determining that an unacceptable substrate process condition exists.

1 12. The system of claim 11, wherein the optical inspection data comprises substrate  
2 reflectivity information, specular information, spectral information, substrate defect  
3 information, substrate damage information, particle contamination information, alphanumeric  
4 character information, non-uniform plasma deposition, and any combination thereof.

1 13. The system of claim 11, wherein if the unacceptable substrate process condition exists,  
2 the controller system is configured to initiate a system shut down sequence.

1 14. A processing system, comprising a cluster tool and an optical inspection system  
2 comprising:

3 (a) a plurality of optical inspection systems each comprising a transmitter unit and  
4 a receiver unit and each configured to perform an optical inspection process at a first degree of  
5 optical resolution and each disposed at different locations on the cluster tool;

6 (b) an inspection platform connected to the cluster tool configured to perform an  
7 optical inspection process at a second degree of optical resolution;

8 (c) a controller system connected to the plurality of optical inspection systems and  
9 the inspection platform and configured to:

10 (i) process optical signal information indicative of a topographical  
11 condition on a substrate inspected by at least one of the plurality of optical inspection  
12 systems; and

13 (ii) in response to the topographical condition, cause execution of one of a  
14 plurality of subsequent substrate handling steps, wherein a first substrate handling step  
15 comprises transferring the substrate to the inspection platform for further optical  
16 inspection; and

17 (d) an input device configured to allow operation of the controller by an operator.

1 15. The system of claim 14, wherein the cluster tool comprises a transfer chamber and a  
2 processing chamber connected to the transfer chamber and wherein at least one of the plurality  
3 of optical inspection systems is disposed on the transfer chamber and at least one of the  
4 plurality of optical inspection systems is disposed on the processing chamber.

1 16. The system of claim 14, wherein each of the optical inspection systems is disposed on a  
2 processing system along a transfer path of the substrate.

1 17. The system of claim 14, wherein the receiver unit comprises at least one of a charge-  
2 coupled device (CCD) camera and a spectrometer.

1 18. The system of claim 14, further comprising an input unit for inputting control  
2 information utilized to operate the controller system.

1 19. The system of claim 14, wherein the controller system is configured to cause execution  
2 of the first substrate handling step by:

3 determining whether optical inspection data collected by at least one of the plurality of  
4 optical inspection systems exceed a predetermined value; and

5 if so, determining that an unacceptable substrate process condition exists.

1 20. The system of claim 19, wherein the optical inspection data comprises substrate  
2 reflectivity information, specular information, spectral information, substrate defect  
3 information, substrate damage information, particle contamination information, alphanumeric  
4 character information, non-uniform plasma deposition, and any combination thereof.

1 21. The system of claim 19, wherein if the unacceptable substrate process condition exists,  
2 the controller system is configured to execute a shut down sequence to remove the substrate  
3 from the processing system.